UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUMMARIES OF DATA ON AND LISTS OF REFERENCES TO METALLIC AND SELECTED NONMETALLIC MINERAL OCCURRENCES IN ELEVEN QUADRANGLES IN NORTHERN ALASKA, SUPPLEMENT TO OPEN-FILE REPORT 75-628

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Open-File Report 81-767A

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This report is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards and stratigraphic nomenclature.

Introduction

This report was prepared as a supplement to a 1975 report which summarized data on mineral occurrences in northern Alaska (Cobb, E. H., 1975, Summary of references to mineral occurrences (other than mineral fuels and construction materials) in northern Alaska: U.S. Geological Survey Open-File Report 75-628, 106 p.). As a result of suggestions from users of the series of which the 1975 report is a part, this supplement is released in two parts; Part A, which presents summaries of data to January 1, 1981, and Part B, which consists of reference lists for each occurrence.

In Part A data from most reports released between the cut-off date (January 1, 1975) for the original report and January 1, 1981, have been incorporated in new or rewritten summaries where appropriate. For each occurrence described in Part A, the name, U.S. Bureau of Mines mining district, reference (if any) that has the occurrence plotted on a map at a scale of 1:250,000, list of mineral commodities, and location data are in the same format as in the 1975 report. This report does not include references to bentonite because it is so widespread in rocks of Cretaceous age north of the Brooks Range that including the few occurrences for which there are specific data would give a false impression of scarcity. Data on mineral occurrences in the Ambler River, Philip Smith Mountains, and Survey Pass quadrangles have been or will be released in separate reports. The only commodity listed in the 1975 report in the Umiat quadrangle is bentonite, so that quadrangle does not appear in this report. Also included at the end of Part A are updated lists of synonyms, owners, operators, and claim names.

In both parts citations are in standard bibliographic format with the exception that references to reports and maps in numbered publication series also show, in parentheses, an abbreviation for the report or map series and the number of the report or map. Abbreviations used are:

B	U.S. Geological Survey Bulletin
C	U.S. Geological Survey Circular
OF	U.S. Geological Survey Open-File Report
MF	U.S. Geological Survey Miscellaneous Field Studies Map
P	U.S. Geological Survey Professional Paper
TDM	Alaska Territorial Department of Mines Pamphlet
USBM OF	U.S. Bureau of Mines Open-File Report

In Part B each citation to the principal references used in preparing summaries in Part A is preceded by an asterisk. The form of citation used in the reference list for each occurrence is considered sufficient identification for each numbered report or map to be found easily in most libraries. Complete references to reports without identifying numbers are listed at the end of Part B.

The following seven U.S. Bureau of Mines Open-File Reports were not used in preparing this supplement because descriptions of most occurrences are not sufficiently detailed to allow evaluation of deposits. In many descriptions it is not possible to determine if a potentially valuable mineral was identified or if the report is based solely on an analysis of a sample collected during a geochemical survey. Most specific data are also

in other reports, such as Degenhart and others, 1978 (USBM OF 103-78) and Grybeck, 1977 (OF 77-166C).

Staff, Alaska Field Operations Center, 1978, Mineral data appraisal of the proposed Noatak National Ecological Reserve, Alaska: a preliminary comment: U.S. Bureau of Mines Open-File Report 67-78, 33 p.

_____, 1978, Mineral appraisal of the proposed Gates of the Arctic Wilderness National Park, Alaska: a preliminary comment: U.S. Bureau of Mines Open-File Report 109-78, 29 p.

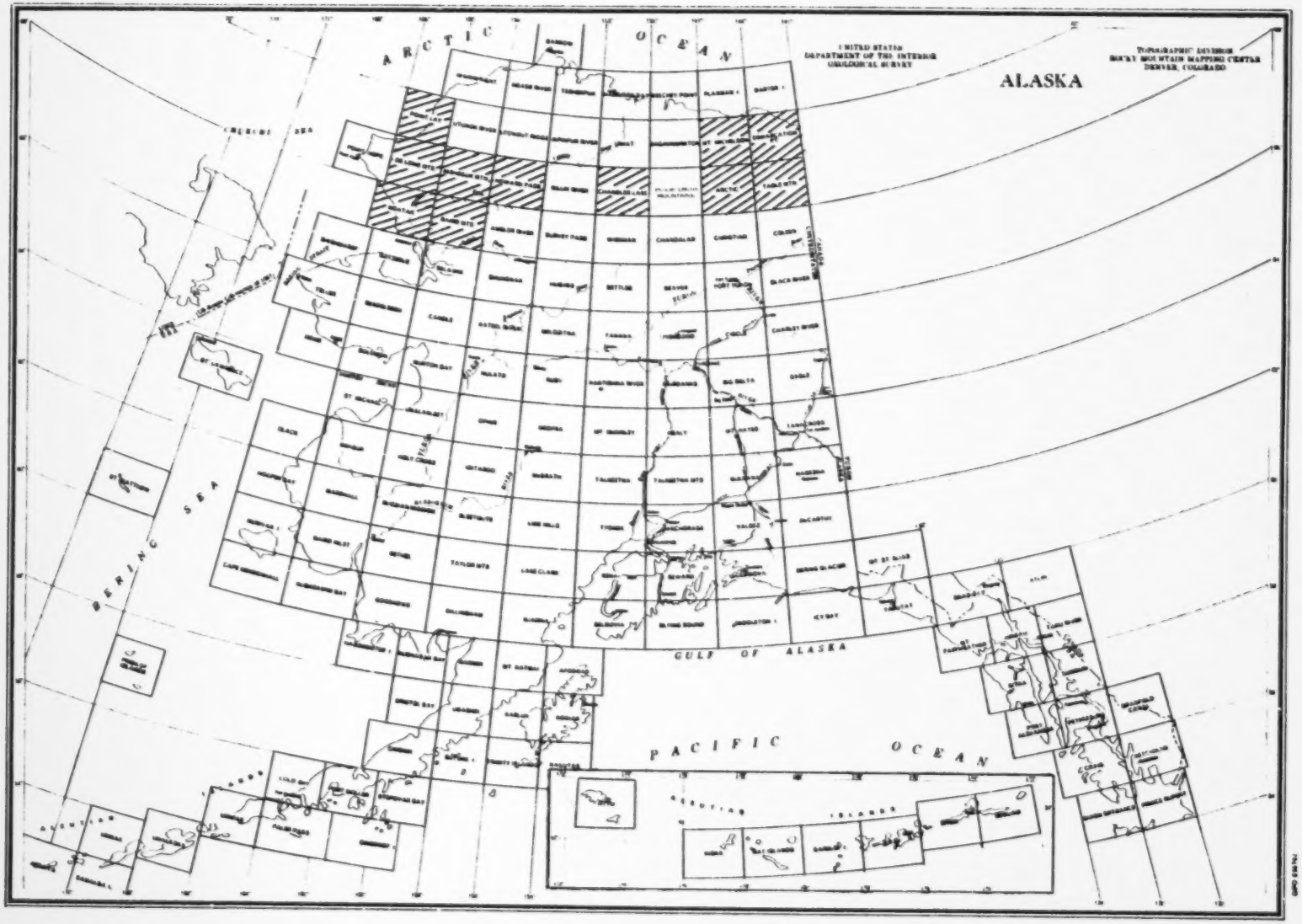
_____, 1978, Mineral appraisal of the proposed Kobuk Valley National Park, Alaska: a preliminary comment: U.S. Bureau of Mines Open-File Report 110-78, 31 p.

_____, 1979, A mineral appraisal of the areas traversed by the Kobuk, Killik, Alatna and John Rivers and the North Fork of the Koyukuk River, Brooks Range, Alaska: a summary report: U.S. Bureau of Mines Open-File Report 36-79, 23 p.

_____, 1979, A mineral appraisal of the areas traversed by the Salmon and Noatak Rivers in the western Brooks Range: a summary report: U.S. Bureau of Mines Open-File Report 50-79, 16 p.

_____, 1980, Mineral appraisal of the proposed Utukok and Colville Wild and Scenic Rivers: a summary report: U.S. Bureau of Mines Open-File Report 37-80, 8 p.

_____, 1980, Mineral deposits of the Cape Krusenstern area, Alaska: a preliminary comment: U.S. Bureau of Mines Open-File Report 42-80, 22 p.


ALASKA
ARCTIC OCEAN
BERING SEA
GULF OF ALASKA
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ALEUTIAN ISLANDS

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ARCTIC QUADRANGLE

(Chandalar R., headwaters)	Copper
Chandalar district	Arctic (18.5, 17.1) 68°57'N, 144°04'W

Malachite and azurite in Devonian sandstone.

(Ivishak R.)	Fluorite
Canning district	Arctic (1.5, 14.75) approx. 68°51'N, 146°46'W approx.

Fluorite and pyrite in veinlets and fracture fillings in siliceous sedimentary rocks.

(Koness R., headwaters)	Copper
Sheenjek district	Arctic (15.5, 7.5) approx. 68°25'N, 144°36'W approx.

Malachite and pyrite in green shale associated with red hematitic shales. Sediment samples from area contain more than 1% Mn.

(Porcupine Lake)	Fluorite
Canning district	Arctic (3.5, 14.4) approx. 68°49'N, 146°28'W approx.

Cobbles and small boulders of fluorite, generally purple, in carbonaceous argillaceous chert. Sample contained a trace of Pb.

Unnamed occurrence	Copper
Chandalar district	Arctic (4.2, 1.5) approx. 68°05'N, 146°21'W approx.

Siderite, limonite, chalcocite, and traces of bornite and malachite in fine- to medium-grained andesitic tuff.

Unnamed occurrence	Copper
Chandalar district	Arctic (1.75, 4.7) approx. 68°16'N, 146°44'W approx.

Malachite in Upper Devonian green shale associated with red hematitic shales. Sample of green shale contained 4,200 ppm Cu.

Unnamed occurrence	Copper
Canning district	Arctic (5.0, 16.9) approx. 68°58'N, 146°13'W approx.

Malachite, disseminated pyrite and chalcopyrite in gray chert and silicic siltstone.

BAIRD MOUNTAINS QUADRANGLE

(Bear Cr.)	Gold
Kiana district MF-386, loc. 9	Baird Mountains (11.65-11.75, 2.85-2.95) 67°09'N, 160°16'-160°17'W

Bedrock limestone and schist. Placer mining 0.5 mi below forks. Production through 1930 was reported to have been about 95 oz of gold.

(Boldrin Cr.)	Gold
Kiana district MF-386, loc. 5	Baird Mountains (10.4, 2.8) 67°09'N, 160°28'W

Fine, flaky placer gold reported; bedrock mainly schist. Includes reference to (Baldwin Cr.).

(Canyon Cr.)	Gold(?)
Kiana district	Baird Mountains (11.4, 1.4) approx. 67°04'N, 160°20'W approx.

Unconfirmed reports of placer gold.

(Caribou Cr.)	Gold
Kiana district MF-386, loc. 6	Baird Mountains SW 1/4 SE 1/4 quad.

Small tributary (not shown on available maps) of Klery Cr. from which 45-50 oz of coarse placer gold with much attached quartz was mined.

(Central Cr.)	Gold
Kiana district MF-386, loc. 10	Baird Mountains (11.5-11.7, 2.2) 67°07'N, 160°16'-160°18'W

Bedrock mainly limestone. Placer gold fine and flaky. Some of gravel contained about 50¢ worth of gold (at $20.67) per yd^3. Total production through 1930 was probably about 145 oz. Activity reported in later years all may have been prospecting. Includes reference to (Center Cr.).

Chevron — Copper

Kiana and Noatak districts — Baird Mountains (14.7, 15.5)
67°52'N, 159°46'W

Quartz lens or lenses and rubble in an area about 100 x 75 ft contain pyrite, chalcopyrite, and a little malachite. Assays of samples indicate grade of about 0.37% Cu.

(Cross Cr.) — Gold(?)

Kiana district — Baird Mountains (8.9, 3.35) approx.
67°11'N, 160°42'W approx.

Unconfirmed reports of placer gold.

(Eli R.) — Copper

Noatak district
MF-386, loc. 1 (in part) — Baird Mountains (3.8-3.9, 11.15-11.25)
67°38'N, 161°25'-161°26'W

At 67°38'N, 161°26'W a quartz vein in limestone contains malachite and limonite; sample contained 1% Cu. At 67°38'N, 161°25'W a float boulder of quartz contained small blebs of chalcopyrite and minor malachite. Includes reference to (Agashashok R.).

Eskimo — Copper

Noatak district — Baird Mountains (2.15, 8.9) approx.
67°30'N, 161°41'W approx.

Chalcocite and malachite in bleached limestone.

Frost — Barite, Copper, Zinc

Kiana district — Baird Mountains (8.95-9.1, 8.4-8.6)
67°28'-67°29'N, 160°39'-160°40'W

Lenses and pods of barite at least 10 m thick and 25-30 m long occur along a strike distance of about 1.6 km in Devonian dolomite. At least some lenses are 75% barite. Resource probably at least 1 million tonnes; possibly as much as 10 million tonnes. Pinching-and-swelling quartz-calcite-barite veins contain sphalerite and chalcopyrite; sample across 2.4 m contained 0.49% Cu, 13.2% Zn, and 20.7% barite.

Gallahorn — Copper

Noatak district — Baird Mountains (0.6, 3.3) approx.
67°11'N, 161°55'W approx.

Two quartz veins in schist and phyllite contain chalcopyrite.

(Gold Run Cr.) Gold

Kiana district Baird Mountains (11.2, 5.3)
MF-386, loc. 8 67°18'N, 160°21'W

A few ounces of placer gold recovered during assessment work, 1931 or earlier.

(Homestake Cr.) Gold

Kiana district Baird Mountains (10.8, 6.45) approx.
MF-386, loc. 7 67°22'N, 160°24'W approx.

One man placer mined coarse gold for 12 summers; production probably not much more than 50 oz.

Hub Copper

Kiana district Baird Mountains (15.9-15.95, 13.75)
67°46'N, 159°36'W

Two 6-in quartz-calcite veins in dolomite above phyllite contain chalcopyrite and pyrite; average of 2 assays is 0.72% Cu.

(Joe Gulch) Gold

Kiana district Baird Mountains
MF-386, loc. 6 SW 1/4 SE 1/4 quad.

Placer gold near mouth is fine and flaky; more than 0.5 mi upstream it is coarse. Prospecting, but no mining, reported. Small tributary of Klery Cr.

(Klery Cr.) Copper, Gold, Lead(?), Tin(?)

Kiana district Baird Mountains (10.5-11.1, 2.4-5.4)
MF-386, loc. 6 67°08'-67°18'N, 160°21'-160°28'W

Bedrock is limestone and schist with many small quartz veins, the probable source of gold in placers. Placer gold was mined from lowest part of stream gravel and the top foot of weathered bedrock. Gold from several claims was coarse (at least one 8.5-oz nugget) with attached quartz or graphitic schist, but the rest was fine and flaky. Some of the richest deposits may have been reconcentrated from an old channel. Concentrates contained much magnetite, some ilmenite, pyrite, and limonite, and very little garnet. Gold was discovered in 1909 and mining was reported in almost all years until World War II; probably has been some since, but the area was inactive in 1975. Through 1931 estimated production was about 31,300 oz; no data for later years. Mining was mainly by hand methods, but draglines, hydraulic methods, and a small dredge were also used. Copper minerals, galena, and cassiterite have been reported [Anderson, 1947 (TDM 5-R)], but recent exploration has confirmed only the presence of copper minerals, which were found at several places near the Kobuk-Noatak divide. Includes references to (Kiana) and (Squirrel R.) and general references to Kiana district. Some references listed in Part B may be to mining on tributaries or neighboring streams rather than to mining on Klery Cr. itself.

(Maiyumerak Mts.) — Chromite, Copper

Noatak district — Baird Mountains (0.6, 13.8) approx. 67°48'N, 161°53'W approx.

Limited geologic work indicated minor disseminated pyrite, chalcopyrite, and chromite in an ultramafic body. Occurrence may be in Noatak quad. Use of Asik Mtn. in Grybeck, 1977 (OF 77-166C) is probably a lapsus for Maiyumerak Mts. See also (Maiyumerak Mts.) Noatak quad.

(Mink Cr.) — Gold(?)

Kiana district — Baird Mountains (11.65, 11.75) approx. 67°02'N, 160°18'W approx.

Unconfirmed report of placer gold.

Omar — Copper

Kiana district — Baird Mountains (7.45-7.7, 8.5-9.0) 67°29'-67°30'N, 160°51'-160°53'W

Compound fracture 3 km long with individual zones 30 m wide and 300-1,000 m long in tan-weathering Devonian dolomite. Ore deposit formed by breccia and fracture filling with chalcopyrite, bornite, covellite, and malachite. Faulted and brecciated gossan. Deposit explored by about 900 m of diamond drilling. Selected samples assayed up to 1.5% Cu; several were more than 2% Cu.

(Pelu(c)k Cr.) — Gold

Kiana district
MF-386, loc. 4 — Baird Mountains (9.8, 2.75) 67°09'N, 160°33'W

Man who did winter prospecting about 1931 reported finding coarse placer gold.

(Salmon R.) — Copper, Silver

Kiana district — Baird Mountains (14.4, 12.3) 67°41'N, 159°50'W

Rubble of quartz vein in schist contains chalcopyrite and as much as 11 ppm Ag. See also (Temby).

(Salmon R., headwaters) — Copper

Kiana district — Baird Mountains (16.05, 13.95) 67°47'N, 159°35'E

Stream float contains chalcopyrite. Source at or near Hub prospect.

(Temby) — Copper

Kiana district — Baird Mountains (16.45, 10.4)
MF-386, loc. 3 — 67°35'N, 159°33'W

Quartz veins in graphite-chlorite phyllite are 6 in to 3 ft thick, can be traced for 100-250 ft along strike, and contain small blebs and discontinuous stringers of pyrite and chalcopyrite; some malachite. Average of assays of 4 samples is 1.1% Cu, 0.07 oz/ton Ag, and trace of Au. Called (Salmon R.) in some of references listed in Part B.

(Timber Cr.) — Gold(?)

Kiana district — Baird Mountains (9.0-10.2, 5.3-6.4) approx.
67°18'-67°22'N, 160°30'-160°40'W approx.

Placer gold has been reported.

(Trinity) — Fluorite

Kiana district — Baird Mountains (12.8-13.0, 0.5-1.0)
67°01'-67°03'N, 160°06'-160°08'W

Sporadic occurrences of fluorite associated with metamorphosed tactite adjacent to a 2- to 3-mi-long metagranite dike. Scintillometer anomaly also associated with the mineralized zone. [I. L. Tailleur, written communication, 1976].

Uhl — Copper

Kiana district — Baird Mountains (1.75, 3.1) approx.
67°11'N, 161°45'W approx.

Chalcopyrite in quartz vein in schist and phyllite.

Unnamed prospect — Barite, Zinc(?)

Kiana district — Baird Mountains (8.5, 8.15) approx.
67°27'N, 160°44'W approx.

Zinc and barite mineralization extending for about 1 km. Data insufficient to determine if a zinc mineral was identified or if there was only a Zn geochemical determination.

Unnamed occurrence — Copper

Kiana district — Baird Mountains (17.65, 10.7)
67°36'N, 159°21'W

Malachite stain in small quartz vein cutting interlayered marble and phyllite. [I. L. Tailleur, written communication, 1974].

Unnamed occurrence	Copper
Kiana district	Baird Mountains (19.1, 14.25) 67°47'N, 159°06'W

Malachite and minor azurite stain along fractures in quartz veins which cut phyllite. [I. L. Tailleur, written communication, 1976].

Unnamed occurrence	Copper
Kiana district	Baird Mountains (18.95, 15.15) 67°50'N, 159°08'W

Chalcopyrite and malachite in sheared quartz vein cutting black schistose rock. Mineralized zone occurs along a small scarp; may be localized along a fault. [I. L. Tailleur, written communication, 1976].

CHANDLER LAKE QUADRANGLE

(Anaktuvuk R.)	Fluorite, Phosphate
Colville district	Chandler Lake (9.2-10.1, 4.7-4.75) approx. 68°16'N, 151°27'-151°35'W approx.

Samples of phosphate rock from black chert and shale unit of Mississippian Alapah Limestone contained as much as 21.4% P_2O_5. Purple fluorite also present.

(Chandler Lake)	Fluorite, Phosphate, Vanadium
Colville district	Chandler Lake (3.1, 5.8) approx. 68°20'N, 152°31'W approx.

Sample of phosphate rock from Mississippian Alapah Limestone contained 25.6% P_2O_5 and 0.02% V_2O_5. Purple fluorite also present.

(Kiruktagiak R.)	Fluorite, Phosphate, Uranium, Vanadium
Colville district	Chandler Lake (0.75-0.9, 6.6-6.65) 69°23'N, 152°51'-152°53'W

A 38-ft-thick zone of a chert and shale unit in the Mississippian Alapah Limestone contains an average of 12% P_2O_5; a 27-in-thick sequence contains 27% P_2O_5. Samples analyzed for vanadium contained 0.07%-0.49% V_2O_5. One sample contained 0.021% U. Fluorite was a constituent of all samples studied.

(Natvakruak Lake)	Phosphate
Colville district	Chandler Lake (8.5, 5.6) approx. 68°19'N, 151°41'W approx.

Sample of phosphate rock, probably from black chert and shale unit of Mississippian Alapah Limestone, contained 27.9% P_2O_5.

(Tiglukpuk Cr.) — Fluorite, Phosphate, Vanadium

Colville district — Chandler Lake (7.05-7.4, 5.2-5.25)
68°18'N, 151°52'-151°55'W

A 36-ft-thick sequence of the black chert and shale unit of the Mississippian Alapah Limestone averages 8% P_2O_5; a 43-in-thick sequence averages 21% P_2O_5; and 6 beds, none more than 5.5 in thick, contain 30% P_2O_5. Samples analyzed for vanadium contained 0.04%-0.10% V_2O_5. Fluorite was a constituent of all samples studied.

DE LONG MOUNTAINS QUADRANGLE

Hot Dog — Lead, Zinc

Lisburne district — De Long Mountains (13.8, 3.15)
68°10'N, 162°53'W

Gossan, exposed along upper Ikalukrok Cr. and a small tributary, contains sphalerite and galena. Host rock appears to be black shale and chert of Carboniferous age. Believed to have stratigraphic setting and origin similar to those of the Red Dog and Lik deposits. Hot Dog prospect also called Suds. [I. F. Ellersieck, personal communication, 1979].

(Ikuk Cr.) — Gold(?)

Lisburne district — De Long Mountains
SE 1/4 NW 1/4 quad.

Auriferous pyrite(?) reported on Ikuk Cr. in late 1880's was said to carry $3.50 to $8.00 in gold per ton. Iron-sulfide nodules known from sedimentary formations that extend into area, but no gold known or considered likely. Includes reference to Pitmegea R.). See also (Mt. Kelly).

Lik — Barite, Lead, Silver, Zinc

Lisburne district — De Long Mountains (11.7, 3.15)
68°10'N, 163°12'W

Host rocks are dolomite, black chert and shale of Mississippian(?) Lisburne Group. Stratiform deposit of barite in lenses and pods as much as 10 m thick and 1,600 m long and fine-grained sphalerite and galena. Industry has announced reserves of 35 million tons with 10% combined lead and zinc and 2 oz/ton silver. Very little has been published about this prospect. Includes reference to Wulik.

(Mt. Kelly) — Gold(?)

Lisburne district — De Long Mountains
Central 1/4 quad.

Rich gold quartz reported from near Mt. Kelly, which may be the mountain now called by that name at the head of the Pitmegea R. Region is geologically not likely to contain gold. May be the same occurrence as that reported on Ikuk Cr. See also (Ikuk Cr.).

Red Dog	Barite, Lead, Silver, Zinc
Lisburne district MF-404, loc. not numbered	De Long Mountains (14.25, 1.45) 68°04'N, 162°50'W

Area about 9,000 x 3,500 ft (1.13 mi^2) contains stratiform deposits of barite, sphalerite, galena, and minor amounts of pyrite in Carboniferous black shale and chert of Lisburne Group; volcanic rocks exposed about 0.6 mi to the northeast. Rocks displaced by many low-angle thrust faults which juxtaposed different facies of coeval rocks; some higher sheets probably were removed by erosion. Mineralization syngenetic; probably the result of sea-floor precipitation from hot-spring waters. Some sulfides appear as veins and breccia fillings. Barite-rich rock with variable amounts of sulfides appears to be most widely distributed; stratigraphically highest and may mask other sulfide zones. Mapping reveals 3 massive sulfide lenses between 5 and 15 ft thick with horizontal dimensions greater than 1,000 ft. Representative grades are 19.5% Zn, 9.5% Pb, and 3.7 oz Ag per ton. Some samples from veins and from breccia zones are higher in tenor. Some samples of barite-rich material average 83.4% $BaSO_4$ and about 3.5% combined Pb and Zn. No drill-hole data on resources are available. Includes references to (Red Dog Cr.).

(Wulik Knoc)	Copper
Lisburne district	De Long Mountains (12.8, 6.6) 68°22'N, 163°01'W

Coating of malachite and azurite on fractures in small outcrop of gray chert surrounded by maroon shale of Mesozoic age. [C. F. Mayfield. personal observation, 1979].

Unnamed occurrence	Barite
Lisburne district	De Long Mountains (11.2, 2.8) 68°09'N, 163°16'W

Barite cobbles on hillside in a zone 11 x 124 m. Zone is surrounded by argillite of the Siksikpuk Fm. Nearby drainage cut has blocks of ferricrete breccia. [I. L. Tailleur, written communication, 1979].

Unnamed occurrence	Copper
Lisburne district	De Long Mountains (14.4, 7.85) 68°26'N, 162°46'W

Coating of malachite along a 6-in-wide fracture zone subparallel to maroon shale which crops out on a stream cut on the east side of the upper Kukpowruk River. Creek gravels nearby iron stained because of leaching along fracture zone. [C. F. Mayfield, personal observation, 1979].

Unnamed prospect — Lead

Lisburne district — De Long Mountains (13.0, 4.25)
68°14'N, 163°00'W

Only one of four color anomalies northwest of Red Dog prospect at which a base-metal mineral was found. A piece of sandstone(?) was estimated to contain less than 0.1% galena, No geochemical sample more than moderately anomalous in Zn, Pb, or Ag was collected.

DEMARCATION POINT QUADRANGLE

(Aichillik R.) — Rare-earth elements

Canning district — Demarcation Point (5.75, 9.25)
69°32'N, 143°09'W

High yttrium and ytterbium in sample of efflorescent salt that is mainly aluminum sulfate.

(Arey Cr. tributary) — Copper, Lead, Zinc(?)

Canning district — Demarcation Point (0.5, 5.25)
69°18'N, 143°55'W

Galena, sphalerite(?), and chalcopyrite in highly deformed pods or stringers of vein quartz and schistose rock a few inches wide along sheared contacts between granite and quartz monzonite dikes. Includes reference to (Dark Cr. tributary).

(Hubley Cr.) — Copper(?)

Canning district — Demarcation Point (2.5, 5.8) approx.
69°20'N, 143°36'W approx.

Chalcopyrite in quartz was tentatively identified in sheared zones parallel to bedding in lower part of Neruokpuk Formation. Includes references to (Boulder Cr.).

Unnamed occurrence — Copper

Canning district — Demarcation Point (2.4, 4.9)
69°17'N, 143°36'W

Malachite and azurite in calcareous hornfels in Cambrian sandstone near contact with granite of Jago stock.

Unnamed occurrence — Copper

Canning district — Demarcation Point (7.3, 8.3)
69°28'N, 142°49'W

Chalcopyrite in quartz vein in mafic volcanic rocks.

Unnamed occurrence	Fluorite
Canning district	Demarcation Point (0.15, 5.15) 69°18'N, 143°59'W

Fluorite in greisen in granite of Okpilak batholith.

Unnamed occurrence	Fluorite
Canning district	Demarcation Point (0.3, 6.2) 69°21'N, 143°59'W

Fluorite in small isolated granite body near Okpilak batholith.

Unnamed occurrence	Gold, Silver
Canning district	Demarcation Point (0.65, 4.6) 69°16'N, 143°54'W

Traces of gold and silver in pyritic zone in granite of Okpilak batholith.

Unnamed occurrence	Manganese
Canning district	Demarcation Point (10.65, 1.8) 69°06'N, 142°18'W

About 175 ft of highly manganiferous beds in middle of 520-ft thickness of pebble-shale member of Lower Cretaceous Kongakut Formation. Manganiferous section is black, with small pellets and thin beds of sedimentary manganese carbonates; exact chemical composition not known; analyses of a few samples indicated about 5% Mn.

Unnamed occurrence	Molybdenum
Canning district	Demarcation Point (0.2, 4.5) 69°15'N, 143°58'W

Molybdenite at contacts of quartz veins with granite of Okpilak batholith.

HOWARD PASS QUADRANGLE

(Drenchwater Cr.)	Barite, Fluorite, Lead, Zinc
Colville district	Howard Pass (1.15-2.1, 9.9-10.1) 68°34'N, 158°40'-158°44'W

Stratiform volcanogenic deposit of fine-grained galena, sphalerite, and pyrite with minor amounts of barite and rare fluorite in black chert, shale, volcanic graywacke, and interbedded volcanic rocks (possibly some sills) of the Mississippian (Lower Pennsylvanian?) Lisburne Group. Sporadic occurrences of sphalerite and galena occur along a 1.25-mi linear zone that parallels the strike of bedding. Country rock dismembered by thrust faults into tectonic breccia, but individual thrust sheets are still recognizable. Host rock for sulfides appears to be black shale and chert of Carboniferous age; some barite in siltstone, shale, and chert of younger

Siksikpuk Formation. Sulfides apparently syngenetic and deposited by submarine volcanic exhalations at or near the top of the sedimentary pile; some sulfides also present as fracture fillings. K-Ar ages on biotite in volcanic rocks associated with deposit are 330 ± 17 m.y. and 319 ± 10 m.y., about the same as ages of volcanic rocks associated with other base-metal deposits of western Brooks Range. No data on quantity of resource at Drenchwater Cr.

(Kiligwa R.) — Barite

Colville district — Howard Pass (6.25, 10.35)
68°35'N, 158°30'W

Lens of nearly pure barite 1 m thick and at least 10 m long on south-facing slope of tributary valley of Kiligwa R. Lens is parallel to bedding in shale of the Siksikpuk Fm. [C. F. Mayfield, personal observation, 1977].

(Lisburne Ridge) — Phosphate, Vanadium

Colville district — Howard Pass (14.4, 11.4) approx.
68°38'N, 156°45'W approx.

A sample from a rubble zone of black chert, black paper shale, black shaly dolomite, and oolitic phosphate rock derived from the Carboniferous Lisburne Group contained 24.8% P_2O_5 and 0.17% V_2O_5.

(Mt. Bupto) — Fluorite, Phosphate, Uranium

Colville district — Howard Pass (9.4, 9.2) approx.
68°31'N, 157°32'W approx.

Sample of mudstone from dark-colored rocks probably correlative with the Carboniferous Alapah Limestone contained 13.7% P_2O_5 and 0.004% U. Talus contains green and purple fluorite.

(Rolling Pin Cr.) — Barite

Colville district — Howard Pass (1.55, 10.65)
68°36'N, 158°45'W

Lag deposits of small barite nodules and local thin barite seams in intensely folded chert of Siksikpuk Formation.

(Safari Cr.) — Barite

Colville district — Howard Pass (8.75, 7.6)
68°26'N, 157°38'W

Sparse, rich concentrations of barite nodules weathered out of Siksikpuk Formation.

(Siniktanneyak Mtn.) — Chromite, Silver

Noatak district — Howard Pass (3.5-4.65, 5.45-6.4)
68°19'-68°22'N, 158°17'-158°28'W

Peridotite in mafic-ultramafic complex contains widespread disseminated chromite and small (largest 8 in thick and 12 ft long) chromit -bearing lenses. Sample of pyrite-bearing feldspathic dike(?) in pillow basalt at eastern edge of complex (68°21'N, 158°17'W) contained 20 ppm Ag.

(Story Cr.) — Lead, Zinc

Colville district — Howard Pass (6.9, 6.8)
68°23'N, 157°56'W

Sphalerite and galena in quartz veins in Upper(?) Devonian to Lower(?) Mississippian sandstone, siltstone, and shale cut by fine-grained igneous dikes.

Unnamed occurrence — Copper

Colville district — Howard Pass (13.7, 11.5)
68°38'N, 156°51'W

Chalcopyrite blebs in Triassic limestone and chert adjacent to a small mafic sill or dike. [I. L. Tailleur, written communication, 1968].

MUSHEGUK MOUNTAIN QUADRANGLE

(Avan R.) — Chromite, Nickel

Noatak district — Misheguk Mountain (0.2-0.6, 4.0-4.4)
69°14'-69°15'N, 161°54'-161°57'W

Small layers or bands of chromite in north-central part of an ultramafic pluton. Disseminated chromite widely distributed. During polished-section studies pyrrhotite and pentlandite were found in a few specimens.

(Ginny Cr.) — Copper, Lead, Silver(?), Zinc

Noatak district — Misheguk Mountain (4.6, 5.15)
68°17'N, 161°18'W

Deposit is in lowest (Brooks Range) thrust sequence in area; host rocks are Devonian-Mississippian Noatak Sandstone and a thin limestone tongue of the gradationally overlying Utukok Formation. Sulfide minerals (sphalerite, galena, pyrite, and rare chalcopyrite) occur mainly as minute crystals scattered through sandstone, which contains considerable siderite where mineralized and none elsewhere. Some outcrops of massive sulfides. Mineralized area is at least 1 mi long and up to 1/2 mi wide. Deposit apparently formed by subsurface hydrothermal open-space filling and replacement rather than by hot-spring deposition on sea floor as seems to have happened at other presumably contemporaneous base-metal deposits in the

western Brooks Range. Rock and stream-sediment sampling indicate that the deposit may contain silver; host mineral(s) not determined. Some quartz veins cut sedimentary rocks; most are barren, but some contain rare sulfides.

(Inaccessible Ridge)
Noatak district

Copper
Misheguk Mountain (1.0, 8.25)
68°28'N, 161°51'W

Malachite stains on fractures and marcasite nodules in tightly folded Triassic chart.

(Kagvik Cr.)

Noatak district

Barite, Gypsum(?)

Misheguk Mountain (3.7, 6.6) approx.
68°22'N, 161°25'W approx.

Prominent iron-stained yellow clay (bentonite?) horizon with local sparse barite and gypsum(?). Zone is at contact between intensely deformed dark chert and shale of the Carboniferous Lisburne Group and maroon and gray shale of younger Siksikpuk Formation.

(Kugurorok R.)

Noatak district

Chromite

Misheguk Mountain
SW 1/4 SW 1/4 SW 1/4 quad.

Specimen of chromite said to have come from near mouth of Kugururok R. Could have been derived from one of the ultramafic bodies to the north or northeast.

(Misheguk Mtn.)

Noatak district

Chromite, Nickel(?)

Misheguk Mountain (6.1-6.25, 4.35)
68°15'N, 161°02'-161°04'W

Chromite occurs as discontinuous bands less than an inch wide, small pods, and disseminations in part of a large serpentinized ultramafic body. A greenish mineral tentatively identified as garnierite was found.

(Nimiuktuk R.)

Noatak district

Barite

Misheguk Mountain (13.55, 7.5)
68°25'N, 159°54'W

Small hill surrounded by tundra made up of cobble- and boulder-size fragments of barite. Nearest bedrock exposures, 500-600 m away, are Upper Mississippian black shale and chert in contact with Cretaceous clastic rocks and altered volcanic rocks (K-Ar age 333 $\pm$ 17 m.y.) and sandy limestone of Mississippian Utukok Formation. Volcanic rocks probably were originally dacite or andesite. Utukok Formation rocks probably are part of a higher thrust sheet and unrelated to barite deposit. Deposit above level of tundra contains a minimum of 12,500 tonnes of high-grade barite; entire deposit likely to be several times as large.

Unnamed occurrence	Copper
Noatak district	Misheguk Mountain (17.2, 1.9) 68°05'N, 159°22'W

Two quartz veins about 2 ft thick cut Upper Devonian gray shale and sandstone. Malachite stains in fractures in the quartz vein. Outcrop is a stream cut on north side of Noatak R. [I. L. Tailleur, written communication, 1966].

Unnamed occurrence	Copper
Noatak district	Misheguk Mountain (17.5, 9.7) 68°32'N, 159°15'W

Sparse malachite staining in a small quartz-jasper vein cutting Carboniferous chert. Outcrop is isolated in Cretaceous mudstone and wacke by thrust faults. [C. F. Mayfield, personal observation, 1978].

MT. MICHELSON QUADRANGLE

(Canning R.)	Gold(?), Mercury(?)
Canning district	Mt. Michelson SW 1/4 quad.

Doubtful reports of an auriferous quartz vein and of cinnabar.

(Esetuk Glacier)	Copper, Fluorite, Lead, Zinc
	Mt. Michelson (16.35, 5.65) 69°18'N, 144°22'W

Skarn contains galena, sphalerite, malachite, azurite, and quartz-tourmaline-fluorite veins. As much as 300 ppm Sn and 1,500 ppm W, but no tin or tungsten minerals reported. Schist contains fluorite. In contact zone west of Okpilak batholith. Includes reference to (Esotuk Glacier).

(Fire Cr.)	Phosphate, Rare-earth elements
Canning district	Mt. Michelson (11.0, 9.5) 69°32'N, 145°12'W

Phosphate rock from Triassic Shublik Formation contains as much as 19.17% P_2O_5 and several times the average concentrations of rare-earth elements for similar rocks.

(Hulahula R.)	Phosphate
Canning district	Mt. Michelson (16.15, 8.75) 69°29'N, 144°23'W

Sample of black limestone with phosphate nodules from top of exposed section of Triassic Shublik Formation contained about 15% P_2O_5.

(Itkillik Cr.)	Copper
Canning district	Mt. Michelson (15.6, 0.85) 69°02'N, 144°31'W

Chalcopyrite in phyllite interbedded with chert and volcanic rocks of Cambrian-Ordovician Neruokpuk Formation.

(Itkilyariak Cr.)	Copper
Canning district	Mt. Michelson (12.8, 11.5) 69°38'N, 144°45'W

Native copper reported in basalt. Includes reference to (Mt. Weller).

(Katak Cr.)	Tin
Canning district MF-462, loc. 4	Mt. Michelson (14.25, 5.45) 69°18'N, 144°42'W

Cassiterite in Mississippian Kekiktuk Conglomerate; may have been derived from apophyses of granite mass of Romanzof Mts. Some cassiterite may still remain in contact zones or in greisens and pyritic zones in the granite.

(Katakturuk R.)	Phosphate, Uranium
Canning district	Mt. Michelson (8.6, 10.35) 69°35'N, 145°36'W

Sample collected from basal 20 ft of a 100-ft-thick sequence of black oolitic limestone near base of Triassic Shublik Formation contained 35.8% P_2O_5 and 0.008% U. Phosphate rock is fine-grained containing equigranular phosphatic pellets about 0.2 mm long; angular quartz grains make up about 3% of the rock.

(Kolotuk Cr.)	Copper, Fluorite, Rare-earth elements(?)
Canning district	Mt. Michelson (15.9-16.05, 5.1-5.45) 69°16'-69°17'N, 144°25'-144°26'W

At 69°16'N, 144°26'W azurite-malachite stains on limestone in thermally altered zone at granite contact. No sulfides seen [W. P. Brosgé, personal observation, 1976]. Heavy-mineral fraction of a concentrate sample of stream-sediments collected at 69°17'N, 144°25'W contained yttrocerite(?), fluorite, and 0.030% eU.

(Leffingwell Glacier)	Molybdenum
Canning district	Mt. Michelson (17.9, 6.15) 69°20'N, 144°07'W

Scattered single crystals and small aggregates (less than 0.5 in diameter) of molybdenite in relatively fresh granite of Okpilak batholith.

(Nanook Cr.)	Copper
Canning district	Mt. Michelson (5.65-5.8, 9.4-9.6) 69°30'-69°33'N, 146°04'-146°05'W

Native copper and malachite and azurite stains in basalt. Axurite and malachite in breccia zone in Devonian or older dolomite overlying the basalt.

(Okpilak R.)	Fluorite, Molybdenum, Rare-earth elements(?), Uranium
Canning district	Mt. Michelson (18.45, 5.75) 69°18'N, 144°01'W

Fluorite, molybdenite, and yttrocerite(?) in samples of granite of Okpilak batholith. Heavy-mineral fractions of concentrates contained 0.034%-0.080% eU; 0.010%-0.033% U.

(Okpilak R., near head)	Gold(?)
Canning district	Mt. Michelson (18.45, 4.05) approx. 69°13'N, 144°02'W approx.

Only known placer gold claim in Arctic Wildlife Range. No production reported, but there probably was enough of a showing to have warranted bringing in the equipment found a few miles away.

(Old Man Cr.)	Phosphate
Canning district	Mt. Michelson (16.9, 8.5) 69°28'N, 144°15'W

Sample from Triassic Shublik Formation contained 22% P_2O_5 and 0.007% eU. Location given in Patton and Matzko, 1959 (P 302-A) is probably not correct.

(Sadlerochit R.)	Phosphate
Canning district	Mt. Michelson (11.2, 8.2) 69°28'N, 145°11'W

Sample from black siltstone unit of basal Shublik Formation (Triassic) containing black phosphate nodules contained 18.4% P_2O_5 and 0.003% eU.

(Shublik I.)	Uranium
Canning district MF-462, loc. 2	Mt. Michelson (5.3, 7.1) 69°24'N, 146°08'W

Sample of black limestone from Triassic Shublik Formation contained 0.001% U.

Unnamed occurrences	Aluminum
Canning district	Mt. Michelson (8.1, 6.65); (15.7, 8.2) 69°22'N, 145°42'W; 69°27'N, 144°27'W

Slightly metamorphosed "pocket-type" ferruginous bauxite (diaspore and pyrophyllite present) on a pre-Mississippian angular unconformity. The average composition of 4 samples from the above localities is: 18.73% SiO_2; 35.00% Al_2O_3; 7.38% Fe_2O_3; 22.25% FeO; 2.96% combined MgO, CaO, Na_2O, K_2O; 10.25% H_2O+; 0.40% H_2O-; 2.65% TiO_2; 0.32% P_2O_5; 0.18% MnO; 0.21% CO_2 (sum 100.33).

Unnamed occurrence	Copper
Canning district	Mt. Michelson (14.6, 0.5) 69°01'N, 144°40'W

Chalcopyrite in brecciated quartzite of Mississippian Kekiktuk Conglomerate.

Unnamed occurrence	Copper
Canning district	Mt. Michelson (14.55, 1.35) 69°04'N, 144°41'W

Chalcopyrite in sheared volcanic rocks.

Unnamed occurrence	Copper
Canning district	Mt. Michelson (11.9, 11.3) 69°38'N, 145°03'W

Copper sulfides in amygaloidal basalt.

Unnamed occurrence	Fluorite
Canning district	Mt. Michelson (18.45, 6.5) 69°21'N, 144°01'W

Fluorite in vein quartz.

Unnamed occurrence	Fluorite, Lead, Rare-earth elements(?)
Canning district	Mt. Michelson (18.0, 6.35) 69°20'N, 144°06'W

Heavy-mineral fraction of pan-concentrate sample contained tourmaline, yttrocerite(?), fluorite, and galena; 0.040% eU.

Unnamed occurrence	Gold
Canning district	Mt. Michelson (15.4, 4.3) 69°14'N, 144°32'W

60 ppm Au and more than 0.1% Sn in panned concentrate of stream sediments collected downstream from zone of altered schist on west flank of Okpilak batholith.

Unnamed occurrence — Phosphate

Canning district — Mt. Michelson (15.8, 11.4)
69°38'N, 144°25'W

Sample from 10-ft-thick bed 25 ft above base of Triassic Shublik Formation contained 20% P_2O_5 and 0.004% eU.

Unnamed occurrence — Phosphate, Uranium

Canning district
MF-462, loc. 1 — Mt. Michelson (4.65, 8.2)
69°28'N, 146°15'W

Sample from 165 ft above base of Triassic Shublik Formation contained 14.7% P_2O_5 and 0.001% U. Bluish-black shale and limestone common throughout 265-ft-thick section of Shublik.

Unnamed occurrence — Tungsten

Canning district — Mt. Michelson (17.95, 6.85)
69°22'N, 144°06'W

Panned-concentrate sample of stream sediment a short distance downstream from edge of Okpilak batholith contained 0.030% eU, pyrite, ilmenite, zircon, sphene, brookite, and scheelite.

NOATAK QUADRANGLE

(Asik Mtn.) — Chromite

Noatak district — Noatak (20.7, 8.75) approx.
67°27'N, 162°25'W approx.

Disseminated chromite and magnetite in dunite of an ultramafic body with poorly defined layering; near southwest part of Asik Mtn.

(Maiyumerak Mtn.) — Copper

Noatak district — Noatak (22.85-23.1, 14.1-14.3)
67°47'N, 162°01'-162°03'W

Minor amounts of pyrite and chalcopyrite in serpentinite and basalt.

Unnamed occurrence — Fluorite

Noatak district — Noatak (18.5, 7.35)
67°24'N, 162°21'W

Small occurrence of purple fluorite associated with white calcite veinlets cutting gray limestone of Devonian or Mississippian age. [C. F. Mayfield, personal observation, 1978].

POINT LAY QUADRANGLE

(Kukpowruk R.) — Thorium, Uranium

Wainwright district — Point Lay (14.25-14.35, 7.5-7.6)
69°25'N, 162°41'-162°42'W

33 samples of sandstone and shale from a stratigraphic thickness of 1,424 m of the Cretaceous Nanushuk Group on the south limb of the Barabara syncline contain an average of 7.30 ppm Th and 1.58 ppm U; maximum contents are 16.14 ppm Th and 3.17 ppm U.

TABLE MOUNTAIN QUADRANGLE

(Bear Mtn.) — Copper, Lead, Silver, Zinc

Sheenjek district — Table Mountain (12.6-12.9, 6.85-7.2)
68°23'-68°24'N, 142°00'-142°03'W

Mountain is a dome of lower Paleozoic and possibly older phyllite, phyllitic sandstone, and fine-grained quartzite overlain by thick probably Devonian conglomerate and, on the east side of the mountain, Mississippian shale; a little greenstone intercalated with some of the older rocks; all intruded by small bodies of rhyolite, galena, sphalerite, and chalcopyrite at contact of a rhyolite dike in quartzite. Galena is abundant in quartz veins at the contacts of some rhyolite dikes and occurs as tiny veinlets, some with and some without quartz, along foliation and small fractures in phyllitic sandstone and greenstone, but not in rhyolite. Samples from which metallic minerals were not reported contained anomalous amounts of Sn and W and as much as 25 ppm Ag. Includes references to (Galena Cr.).

(Double Mtn.) — Copper

Sheenjek district — Table Mountain (0.9, 13.2)
68°45'N, 143°52'W

Azurite in volcanic rocks [H. N. Reiser, oral communication, 1960]. Subsequent analysis of a sample of a quartz vein showed 0.15% Cu and 0.5% Pb.

Synonyms, Owners, Operators, and Claim Names

Baird Mountains quadrangle
(Agashoshok R.) -- see (Eli R.)
Armstrong & Baldwin -- see (Boldrin Cr.)
(Asik Mtn.) -- see (Maiyumerak Mts.)
(Baldwin Cr.) -- see (Boldrin Cr.)
Bear Creek Mining Co. -- see Frost, Omar
(Center Cr.) -- see (Central Cr.)
Columbia -- see (Klery Cr.)
Geffe -- see (Klery Cr.)
Gopher -- see (Klery Cr.)
Greenberg and associates -- see (Klery Cr.)
Hansen -- see (Central Cr.)
Hark Luck -- see (Klery Cr.)
(Kiana) -- see (Klery Cr.)
Klery Creek Mines Co. -- see (Klery Cr.)
Klery Placers, Inc. -- see (Klery Cr.)
Kozak -- see (Peluk Cr.)
Lesamis and associates -- see (Klery Cr.)
Liberty -- see (Klery Cr.)
Missing Link -- see (Klery Cr.)
Oregon -- see (Klery Cr.)
(Squirrel R.) -- see (Klery Cr.)
Star -- see (Klery Cr.)
Suksdorf -- see (Central Cr.)
Teddy -- see (Klery Cr.)
Vera -- see (Klery Cr.)
Westlake -- see (Klery Cr.)
Wise -- see (Homestake Cr.)
Wood -- see (Bear Cr.), (Klery Cr.)
Xavier & Quillen -- see (Gold Run Cr.), (Joe Gulch), (Klery Cr.)
Xavier & Southward -- see (Klery Cr.)

Chandler Lake quadrangle
(Monotis Cr.) -- see (Kiruktagiak Cr.)
(Skimo Cr.) -- see (Tiglukpuk Cr.)

De Long Mountains quadrangle
(Pitmegea R.) -- see (Ikuk Cr.)
(Red Dog Cr.) -- see Red Dog
Suds -- see Hot Dog
Wulik -- see Lik

Demarcation Point quadrangle
(Dark Cr. tributary) -- see (Arey Cr. tributary)
(Boulder Cr.) -- see (Hubley Cr.)

Mt. Michelson quadrangle
(Esotuk Glacier) -- see (Esetuk Glacier)
(Mt. Weller) -- see (Itkilyariak Cr.)

Table Mountain quadrangle
(Galena Cr.) -- see (Bear Mtn.)